# Facts About Fokker

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## History

- Fokker, the Dutch aerospace company, is one of the earliest established aircraft companies in the world, having been founded on July 21, 1919, in Holland by Anthony H. G. Fokker, the legendary aviation pioneer who built his first aircraft in 1910.
- In the period between the two world wars, Fokker became one of the world's largest aircraft producers. Apart from the Amsterdam-based plant, the company owned three factories in the U.S.A.. Fokker airliners contributed greatly to the development of commercial aviation.
- In over 65 years the company developed some 130 different types of aircraft, including passenger transport, fighters, reconnaissance aircraft, bombers, trainers and float-planes.
- In 1939, Anthony Fokker died in the U.S.A. at the age of 49.
- During World War II, the Amsterdam plant was completely destroyed and a new one was opened at Schiphol airport in 1951.
- Today, Fokker is world leader in short-to-medium-haul airliners with close on 1,000 units sold and involved in co-production of other commercial aircraft programs, military aircraft, missile component production, space projects and research and development.

## Ownership

- Fokker is an independent company, listed on the Amsterdam and Brussels stock markets.
- Total share capital is Dfl. 36,590 million. Priority shareholders are Algemene Bank Nederland N.V., N.V. Verenigde Machinefabrieken and Northrop Corporation.

## Organization

The organization structure is based on functional program management in a matrix organization and comprises four main disciplines, each headed by a Director.
The Fokker Board of Management comprises:

| | |
|---|---|
| Frans Swarttouw | – President and Chairman |
| Dan Krook | – Deputy Chairman, Marketing & Sales |
| Frank Nel | – Technology |
| Rob van den Heuvel | – Finance |

## Turnover

- Fokker's turnover in 1984 was Dfl. 1,562 billion with a net profit of Dfl. 23,5 million.

- Civil aircraft production represented some 69% of turnover, military aircraft production 14%, repair and overhaul 9%, space 3% and miscellaneous 5%.

## Plants/Personnel

- The Fokker Headquarters are located in the Atlas Office Center at the new Amsterdam Southeast Business District.
- Fokker has five plants in the Netherlands:
- Schiphol Plant, Amsterdam International airport.
- Drechtsteden Plant, with Papendrecht and Dordrecht Plants (both near Rotterdam)
- Ypenburg Plant, near The Hague
- Woensdrecht Plant, close to the Belgian border
- Hoogeveen Plant, in the north-east
- Total number of employees: some 9,400.

## Subsidiaries

- Fokker Aircraft U.S.A. Inc., based at Alexandria VA, is a wholly owned subsidiary responsible for marketing, sales and support of Fokker aircraft in the U.S.A.

## Activities

- **Amsterdam-Southeast (Business District) Headquarters:** Board of Management, Marketing and Sales, Finance, Personnel and Social Affairs, Corporate Relations, Corporate Strategy, Program Management, Corporate Quality Assurance and General Secretariat.
- **Schiphol Plant:** Design Office, research and development, development and production of the Fokker 50 and Fokker 100, final assembly Fokker F27 Friendship, Fokker F28 Fellowship. Co-production and final assembly of F-16 military fighter, Airbus wing components, spare parts, flight department and space division.
- **Drechtsteden Plant:**
  **Papendrecht:** component production F27, F28, F-16, Airbus and Shorts 330/360 and Sherpa.
  **Dordrecht:** major subassemblies of F27, F28, F-16 and Airbus.
- **Ypenburg Plant:** overhaul, repair and modification of F27s and millitary aircraft, F-16 installation work, composite plastic aircraft components.
- **Woensdrecht Plant:** overhaul, repair and modification of F28s, F-16s, incorporation of customer requirements in F28s, aircraft cable harnesses, electrical and electronic equipment, Patriot

component production (as from mid 1985).
- **Hoogeveen Plant:** milling work, aircraft parts, carbon fibre aircraft components, military aluminium shelters, Ariane launcher components and refurbishing of fuel tanks.

## Fokker F27 Friendship

- world's most successful civil short-haul twin turboprop aircraft for up to 56 passengers in a flexible cabin lay-out, powered by two Rolls-Royce Dart turbopropeller engines.
- available in a wide range of configurations: civil, military transport, target towing, cargo or mixed cargo/passenger version, LADS, aerial survey, navigation trainer, and maritime.
- considerable loading freedom of cargo and a design range of more than 500 nm.
- ability to operate in extremes of climate and from unpaved fields of 1,000 m.
- low operating and seat-mile costs.
- good handling, especially at low speeds, in difficult terrain and in bad weather.
- fail-safe low-weight structure with long fatigue life.
- low maintenance costs resulting from a simple, tough and reliable airframe having good accessibility.
- compliance with US Civil Aviation Regulations and ICAO performance requirements.
- being more than 25 years in production the F27 is constantly improved with over 770 aircraft sold to date.

## Fokker 50

- new generation short-haul 50-seat propjet aircraft, with flexible cabin lay-out for a wide range of configurations.
- propulsion: two Pratt & Whitney PW124 powerplants and new technology six-bladed Dowty Rotol propellers.
- seating capacity matched to profitable short-haul operations, with use of advanced composite materials, maintenance check intervals extended up to 50%, cruise speed will be up to 30 knots higher than that of the F27, lower investment per seat and lower seat mile costs. Passenger cabin will be the most spacious, most comfortable and quietest in its class.
- start final assembly: March 1985
- first flight: November 1985
- certification: Mid 1986
- launching customer: Ansett Transport Industries Ltd of Australia with 15 orders.

## Turboprop powered electronic versions

Market proposals for:

- **Maritime Enforcer:** a maritime patrol aircraft equipped for medium range anti-submarine and anti-surface vessel warfare operations.
  An advanced sensor, navigation and tactical systems, a search radar, passive and active acoustic system and an Electronic Surveillance and Monitoring System (ESM) are integrated systems.
- **Fokker Sentinel:** a border surveillance and stand-off reconnaissance aircraft designed to fulfil missions involving the monitoring of potentially hostile activities around frontiers and equipped with radar for detecting moving vehicles on the ground.
- **Fokker Kingbird:** a cost-effective airborne early warning aircraft to extend the horizon of ground-based integrated air defense systems.
  The Fokker Kingbird can be part of a nation's radar defense network and defense control centers.

## Fokker F28 Fellowship

- short-to-medium-haul twinjet for 65 to 85 passengers.
- cargo, quick-change and executive configurations available.
- the F28 has been constantly improved since first deliveries in 1969.
- seating capacity matched to low density routes, fuel economy 15 - 40% better than comparable twinjets.
- capability to operate from short and unpaved runways and under extreme climate conditions with low noise levels.
- to date over 220 Fokker F28s have been sold.

## Fokker 100

- short-to-medium-haul 100-plus seat new technology fanjet, powered by two new Rolls-Royce Tay engines, with advanced wing aerodynamics, advanced digital electronic flight deck, new wheels and brakes, strengthened main undercarriage, and increased use of advanced composite materials.
- the Fokker 100 design criteria result in lowest investment for any new technology twinjet, lowest tripmile cost of any 100 seater jet, lowest seatmile cost in the category of up to 130 seater aircraft, outstanding performance, compliance with FAR 36 Stage 3 noise requirements.
- start final assembly: Mid 1985

- first flight: Mid 1986
- certification: Spring 1987
- launching customer: Swissair with eight orders and six options.

## F-16 military fighter

- Fokker is European co-producer of the F-16 for the Royal Dutch Air Force and the Royal Norwegian Air Force.
- production of mid-fuselages, wing part sets, main landing gear doors and carbon fibre tail parts. These components are delivered to assembly lines in Belgium and the United States and for third-country sales.
- Fokker runs an F-16 final assembly line which will supply 213 fighters for the Royal Dutch Air Force. The last fighter of a batch of 72 for the Royal Norwegian Air Force was delivered in June 1984.
- first delivery in June 1979, assembly of two F-16s per month. Production contracted until 1992.

## A300/A310 Airbus

- Fokker produces 5,7% of the European A300-600 Airbus.
- Since 1969, the company has manufactured wing moving parts for A300-B2/B4.
- In the A310 Fokker has just over 1% productionshare and manufactures wing parts and carbon fibre undercarriage doors.

## Shorts 330/360

- Fokker is a partner of Shorts of Northern Ireland in the Shorts 330/360 commuter aircraft and Sherpa military transport.
- Since 1974 Fokker has manufactured the outer wings and struts.

## Space programmes

- Fokker entered the space age in 1964 and collaborated on several European Satellites.
- in 1974 the successful first national scientific satellite ANS was launched.
- a second programme has produced the InfraRed Astronomical Satellite IRAS, the largest satellite ever assembled in Europe. IRAS was successfully launched in 1983.
- today involved in: Olympus, Europe's multi-purpose communications satellite, for which service and propulsion modules are built in addition to structures

and mechanisms of the solar arrays and development of the overall ground check-out equipment; production of rigid solar arrays for five ECS and three MARECS satellites.

- during the past years the Fokker Space Division has grown to become a leading specialist in solar arrays. Development of Advanced Rigid Array (ARA) for geostationary orbits; the RARA, a retractable version, is still under design and has been selected by ESA for its Eureca space platform.
- Fokker produces two interstages and the engine thrust frame of the third stage for the Ariane launcher. For Ariane-3 Fokker builds the separation shield between the second and third stage and the nose cones of the liquid propellant boosters for Ariane-4.
- currently under development: a carbon fibre composite interstage 2/3 and a Fokker designed parachute recovery system for Ariane's first stage which will be tested in 1985.
- thermal control hardware and solar panels for Ulysses, Giotto and Hipparcos satellites, to be launched in 1986.
- participation in ERS-1 will comprise thermal control, integration and test of the payload and cable harnesses. Launch 1989.

# THE FOKKER 100

# The Fokker 100

The Fokker 100 fanjet is the first 100-seat airliner to realize the new technology potential of the mid-eighties and to present the resultant remarkable opportunities to airlines operating the world's short-medium-haul routes. The aircraft will serve them from the eighties through and beyond the nineties.

The Fokker 100 has instant passenger appeal. Its spacious interior is highly flexible in layout and offers passengers outstanding comfort in terms of head and shoulder room, low interior noise, carry-all overhead bins, seats of new design, and excellent air-conditioning.

The new Fokker airliner has remarkably low operating cost. It is distinguished by trip cost lower than that of any competitor and by seat-mile cost which equals new and larger aircraft. Its profitability in airline operation is thus unmatched by any competitor.

In fuel-burn per seat and direct operating cost per trip the aircraft shows up to 30% and 15% improvement respectively over current low bypass ratio twinjets.

The Fokker 100 has outstanding performance. It complies with stringent smoke and gas pollution regulations and with Stage 3 noise requirements. Its newly-designed, advanced wing is the fruit of years of research. It is powered by a new engine, the Rolls-Royce Tay, which surpasses in its speed/economy combination any other engine currently available for 100-plus-seat airliners.

In addition, its flight deck, using ARINC 700 avionic equipment and CRTs, ranks among the most sophisticated available in aviation today.

The quantum leap in available technology represented by this marriage of wing, engine, and modern flight deck is available to airlines only in the Fokker 100, with all the ensuing benefits of quality, comfort and economy.

The Fokker 100 can operate effectively in a complementary role with larger contemporary aircraft, being fully compatible in all-weather capability and passenger appeal and offering time-table interchangeability at equal seat-mile cost.

With its low trip and seat-mile costs together with low weight-related cost and exceptional flexibility, the Fokker 100 is fully capable of exploiting and developing the market opportunities offered by direct flights, opening up new routes, increasing frequency and operating profitably on low density sectors.

Take-off thrust of the Rolls-Royce Tay under sea level static ISA conditions is 13,320 lb.

The Fokker 100 advanced digital electronic flight deck incorporates Electronic Flight Instrumentation (EFIS) as standard, including Primary Flight Display (PFD) and Navigational Display (ND) CRTs, Automatic Flight

Control and Augmentation Systems (AFCAS) and Flight Management System (FMS).

The PFD includes attitude, airspeed, barometric and radio altimeter and vertical speed information. There is also a comprehensive navigational display. Both displays are duplicated at left and right-hand stations.

Flexible switching enables transfer of primary flight and navigational information to be presented on either the upper or lower display. Weather radar information is superimposed on the navigational display. Avionics are based on ARINC 700 digital data processing technology and communicated by ARINC 429 digital data bus.

The standard version of the Fokker 100 seats 107 passengers at 32-inch pitch. Other configurations available enable airlines to offer two- or even three-class services, with 37-inch pitch for the first-class section and 32- or 34-inch pitch for business class.

The new Fokker airliner is expected to find its main application over shorter sectors but it also has impressive capability over longer ranges, as the payload/range diagram in this leaflet indicates.

Fail-passive autoland can be accomplished under 400 m runway visual range (RVR) weather limitation with decision height (DH) down to 100 ft. An option can be offered permitting fail-operative autoland under 150 m RVR weather limitation with DH as low as 15 ft.

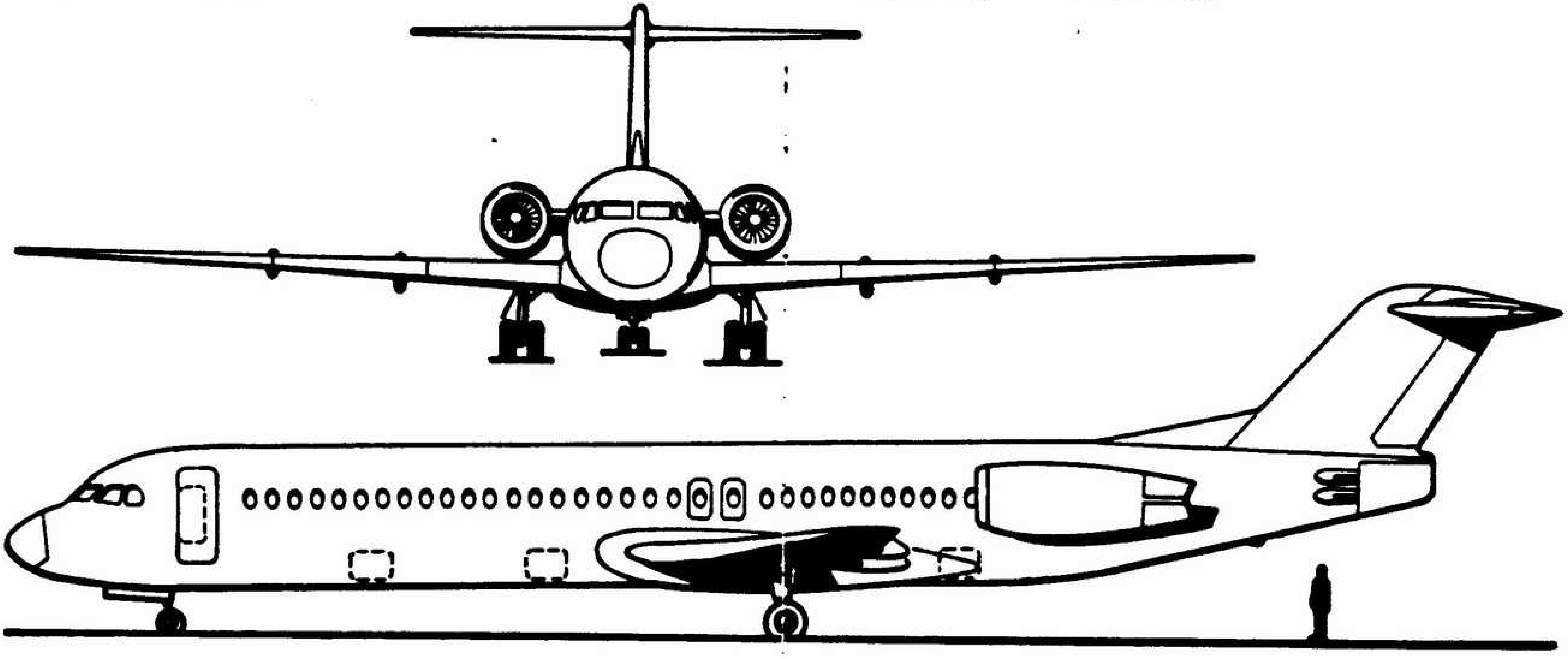
# Fokker 100 characteristics

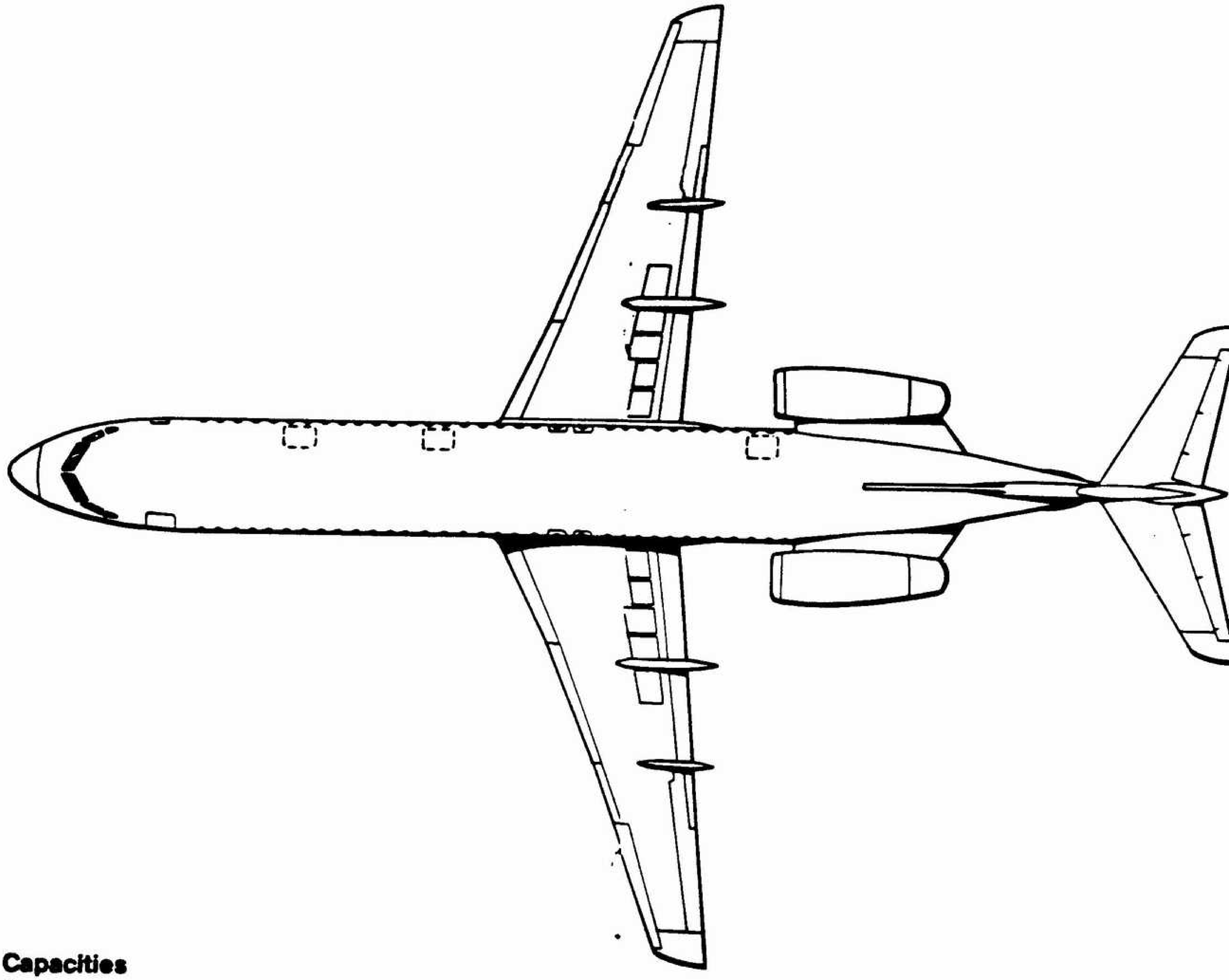
### Main dimensions

| | | |
|---|---|---|
| Span | 28.08 m | ( 92 ft 1.4 in) |
| Overall length | 35.53 m | (116 ft 6.8 in) |
| Overall height | 8.50 m | ( 27 ft 10.5 in) |
| Fuselage length | 32.50 m | (106 ft 7.6 in) |
| Fuselage diameter | 3.30 m | ( 10 ft 9.9 in) |

### Weights

| | | |
|---|---|---|
| Max. ramp weight | 41,730 kg | (92,000 lb) |
| Max. ramp weight (Optional) | 43,320 kg | (95,500 lb) |
| Max. take-off weight | 41,500 kg | (91,500 lb) |
| Max. take-off weight (Optional) | 43,090 kg | (95,000 lb) |
| Max. landing weight | 38,330 kg | (84,500 lb) |
| Max. landing weight (Optional) | 38,780 kg | (85,500 lb) |
| Max. zero fuel weight | 34,700 kg | (76,500 lb) |
| Max. zero fuel weight (Optional) | 35,150 kg | (77,500 lb) |
| Typical operating empty weight (107 seat configuration) | 23,250 kg | (51,260 lb) |
| Weight limited payload | 11,450 kg | (25,240 lb) |





**Capacities**

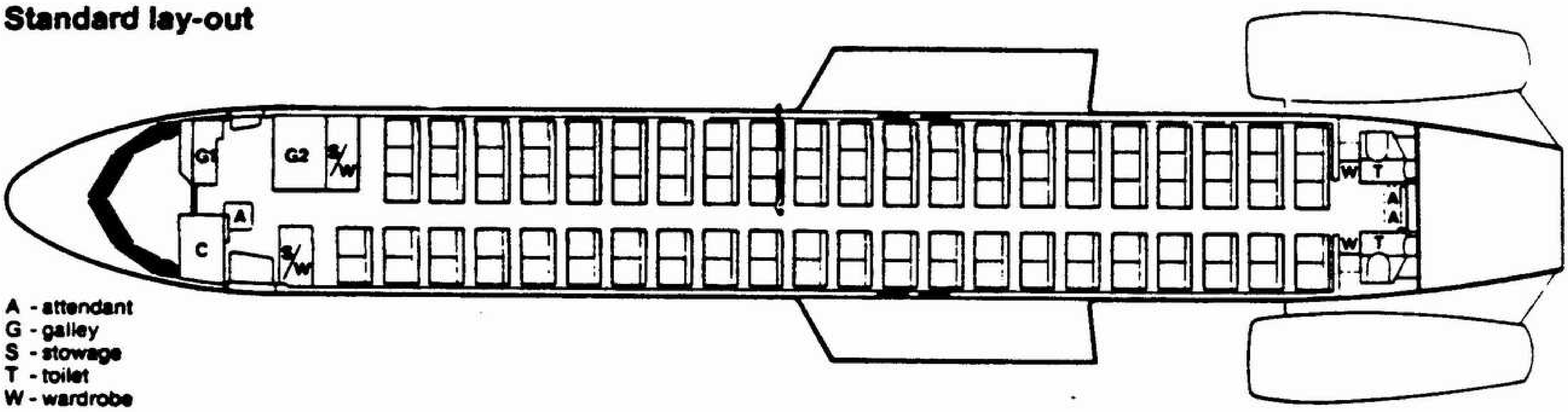
| | | |
|---|---|---|
| Fuel | 3445 US Gall. | (13,040 l.) |

**Powerplant**

| | | |
|---|---|---|
| Engines : | Rolls-Royce Tay | MK 620-15 |
| Take-off thrust at ISA/SL static : | 6042 kg | 13,320 lb |
| Flat rated to : | 28°C | 82.4°F |
| APR rating : | + 5% | |
| By pass ratio : | 3.06 : 1 | |

# Fokker 100 Interior

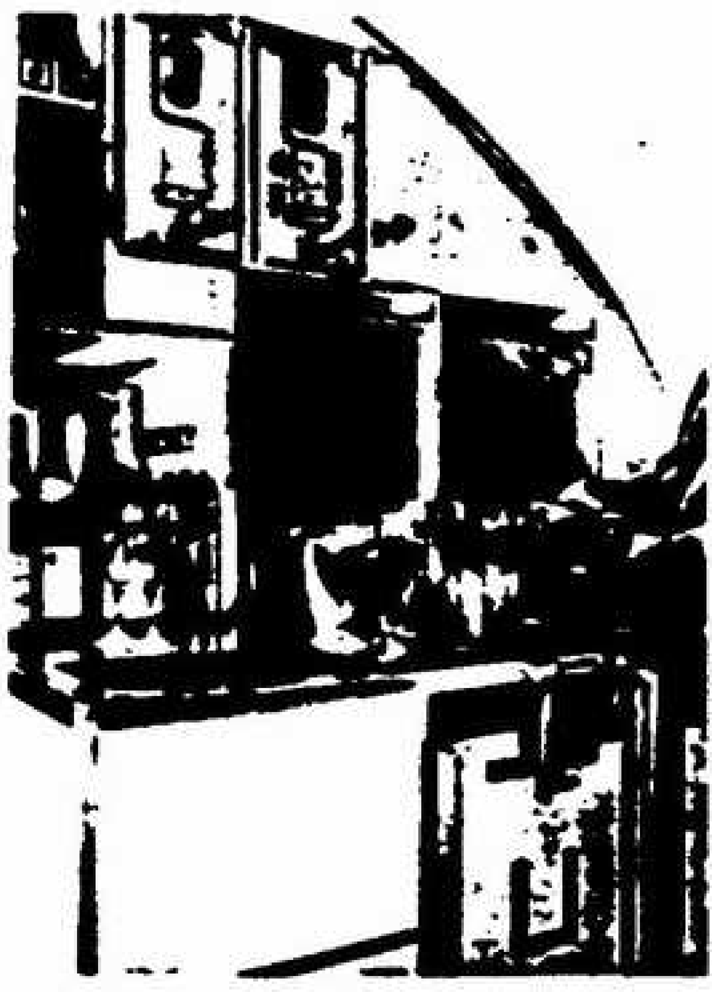
## Standard lay-out



A - attendant
G - galley
S - stowage
T - toilet
W - wardrobe

| **Configuration** | |
|---|---|
| Seats | 107 at 32-inch seat pitch |
| Cabin width | 5 abreast |

| **Dimensions** | | |
|---|---|---|
| Length (excl. flight deck) | 21.19 m | (69 ft 6.2 in) |
| Max. length seating area | 18.80 m | (61 ft 8.0 in) |
| Max. height | 2.01 m | ( 6 ft 7.1 in) |
| Max. width | 3.10 m | (10 ft 2 in) |
| Max. cabin floor area (excl. flight deck) | 58.48 m² | (629.54 sq ft) |
| Max. volume (excl. flight deck) | 107.58 m³ | (3799.00 cu ft) |
| Carry-all overhead luggage bins | 5.23 m³ | ( 184.70 cu ft) |
| Additional stowage space | 3.00 m³ | ( 106.00 cu ft) |
| Passenger entrance | 2.21 x 0.86 m | (87 x 34 in) |
| Service door | 1.31 x 0.73 m | (52 x 29 in) |



A - attendant
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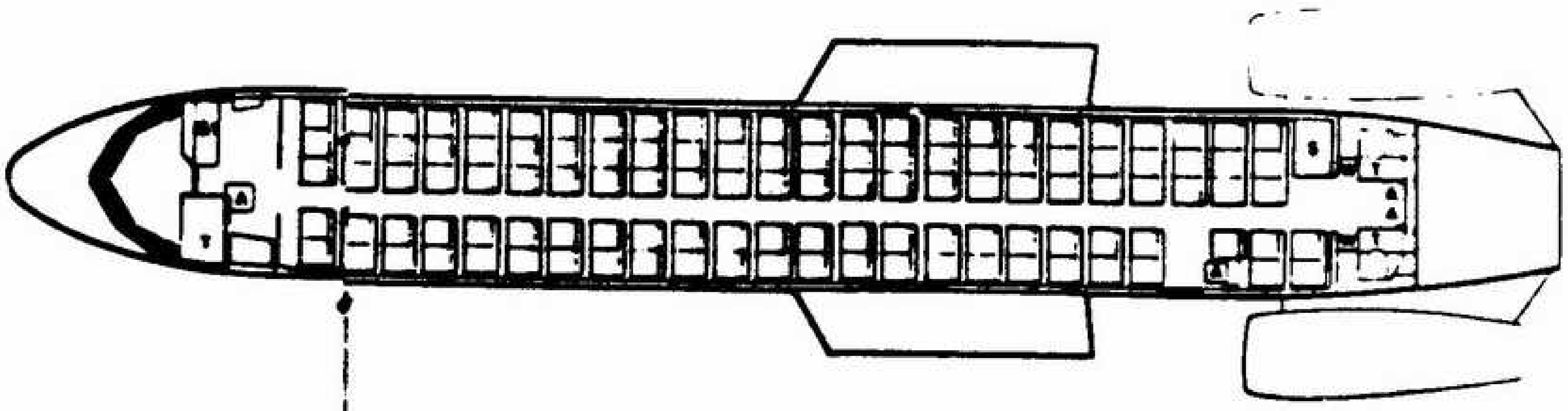
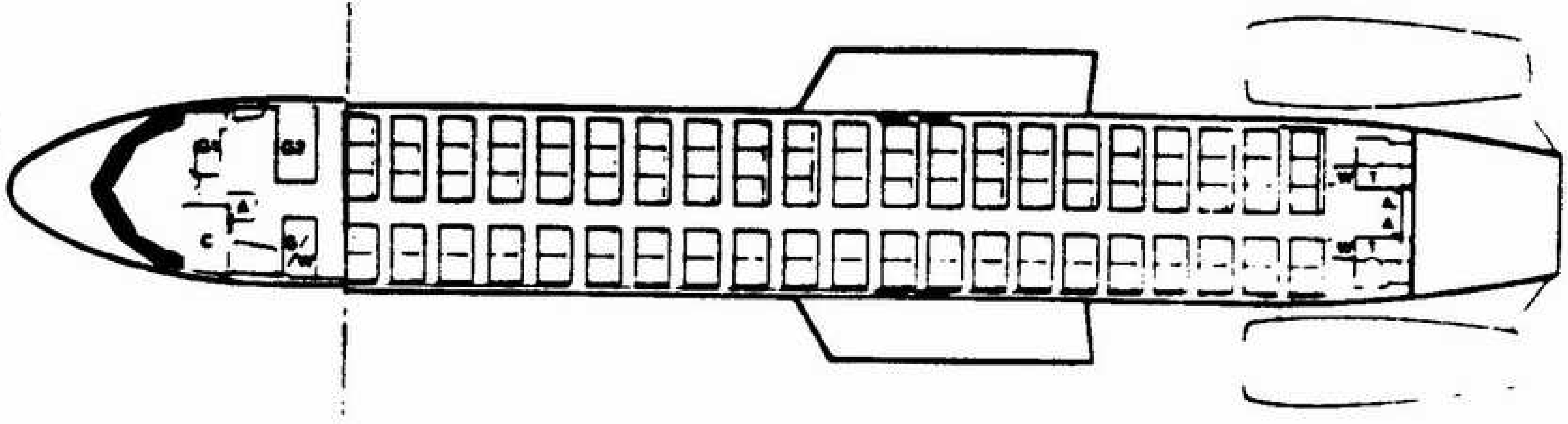
**High density lay-out**

Tourist class 119 passengers
at 29-inch pitch
with optional service door



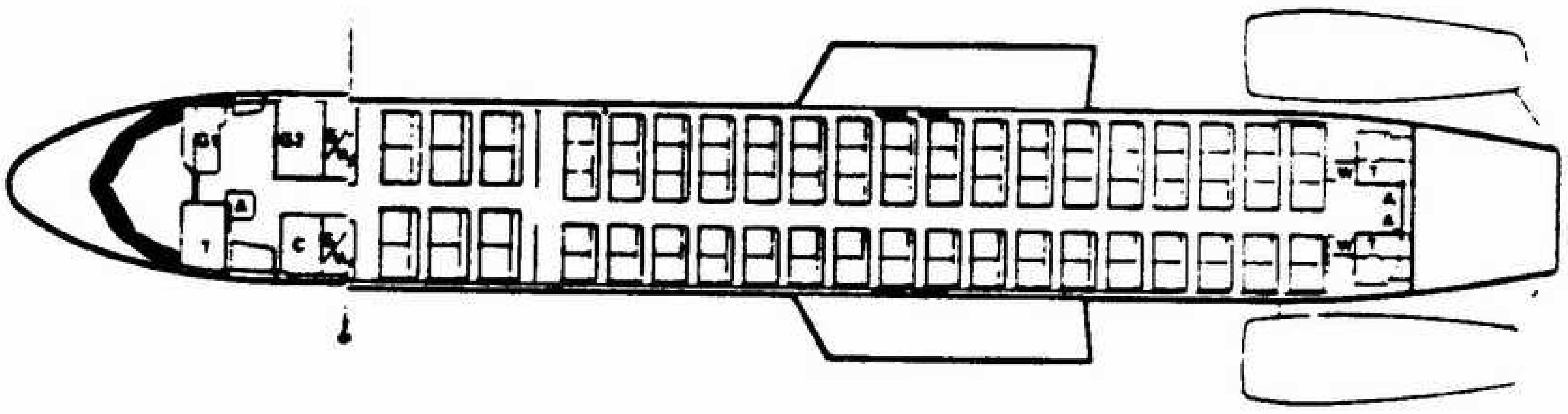
**Business/Economy class lay-out**

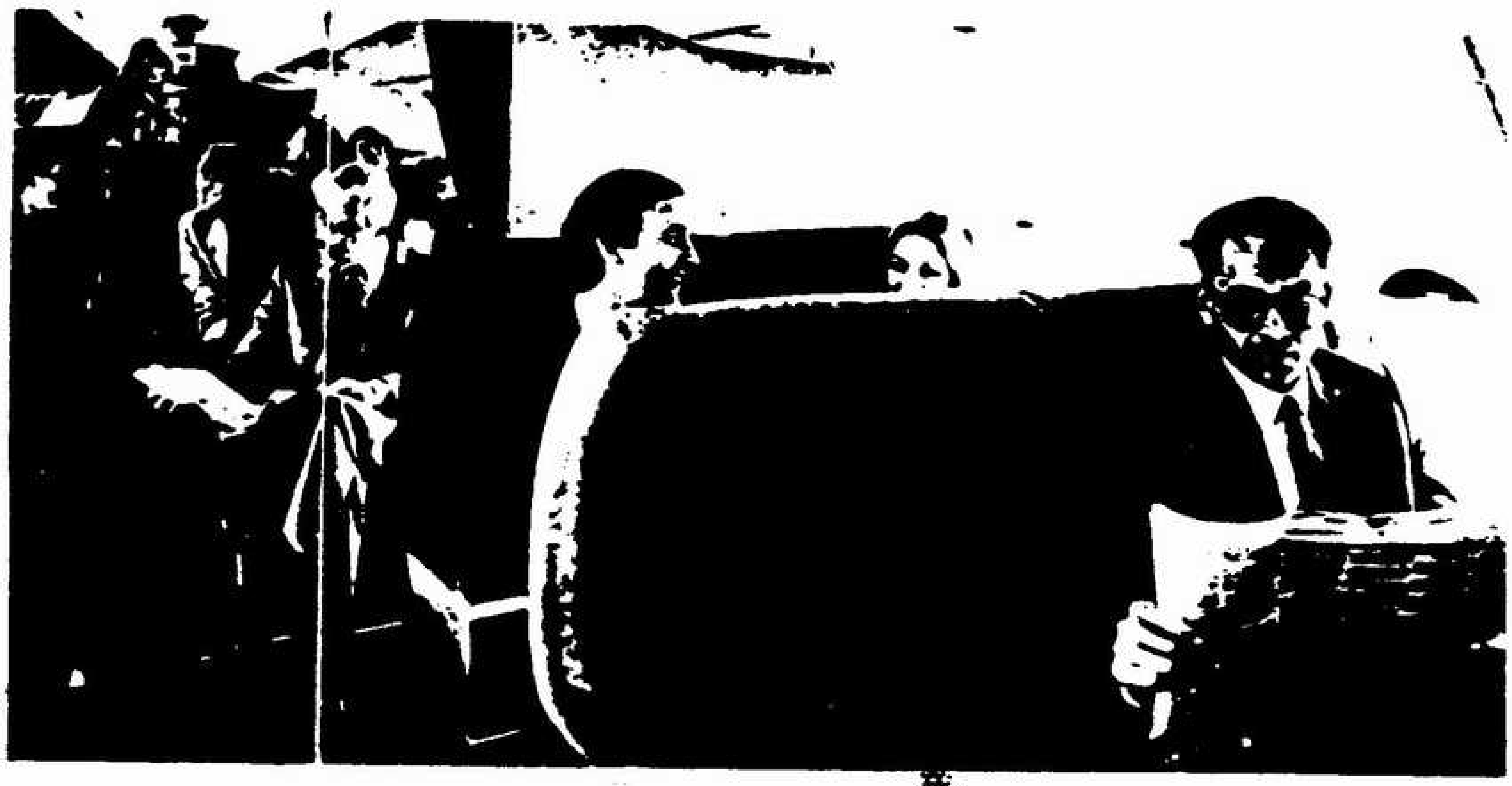
Business/Economy class 105 passengers
- 55 passengers at 34-inch pitch
- 50 passengers at 32-inch pitch



**First/Economy class lay-out**

Mixed class 97 passengers with
separate galley service
- 12 First class at 36-inch pitch
- 85 Economy at 32-inch pitch



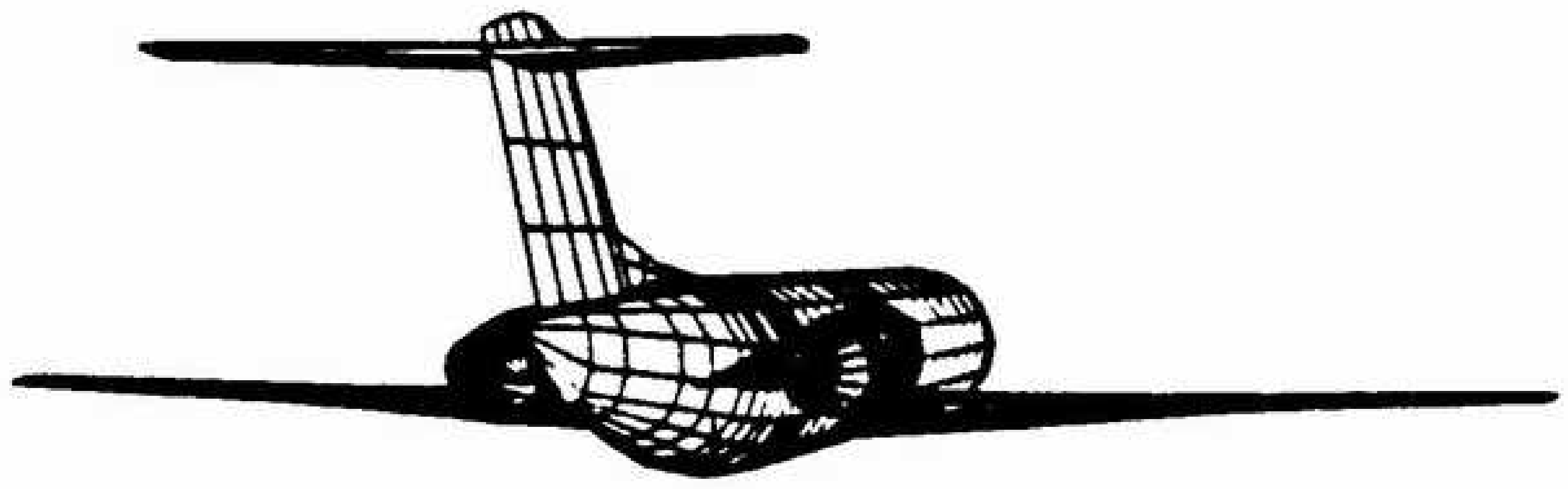


# Fokker 100 Performance

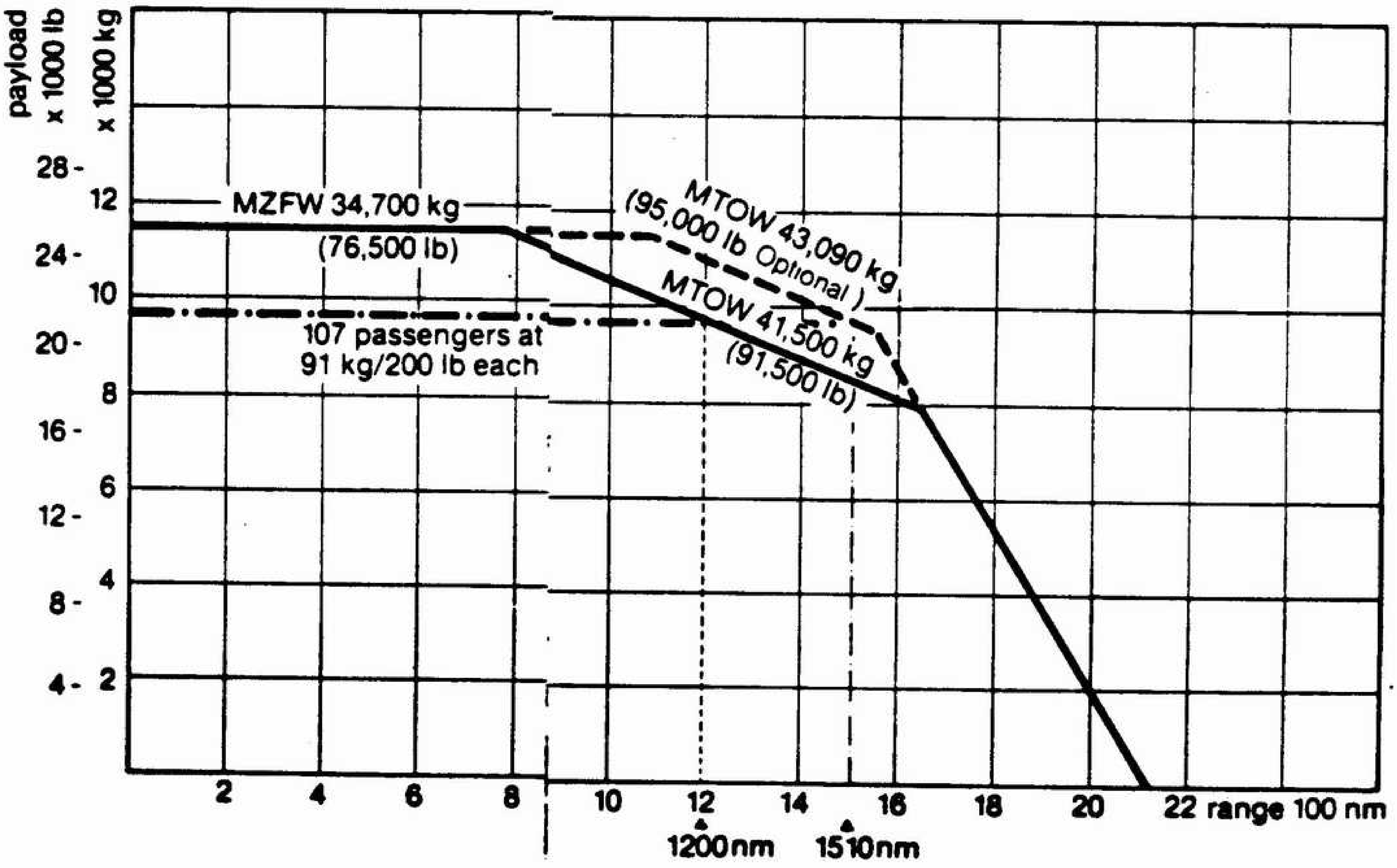
## Assumptions

### Mission

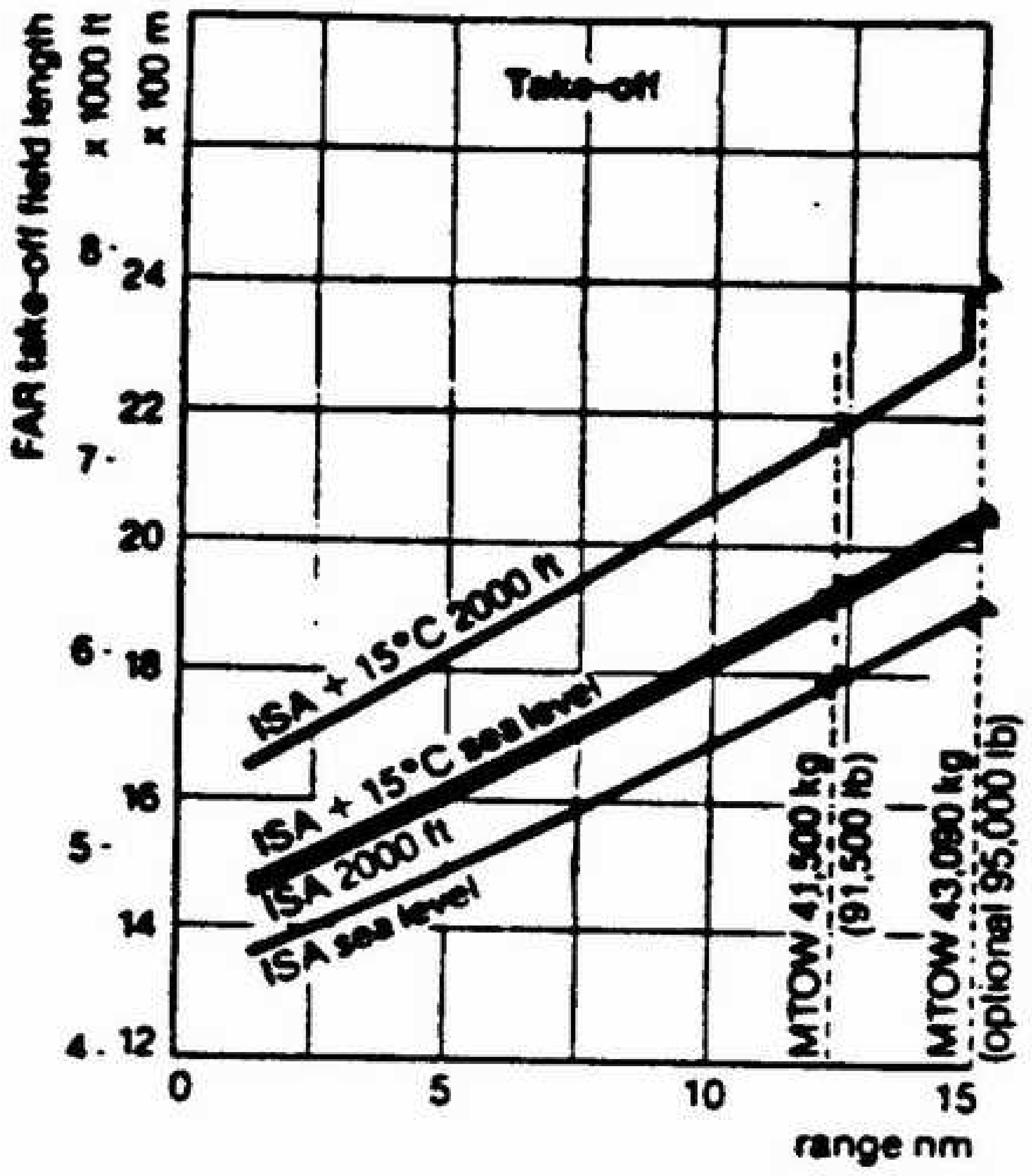
Engine start plus taxi-out : 9 minutes
Take-off to 1500 ft : actual time and fuel (no distance is taken into account)
Speed : long range cruise speed
Approach and landing : 6 minutes plus actual fuel (no distance is taken into account)
Taxi-in : 5 minutes, fuel taken from reserves, though included in block fuel.

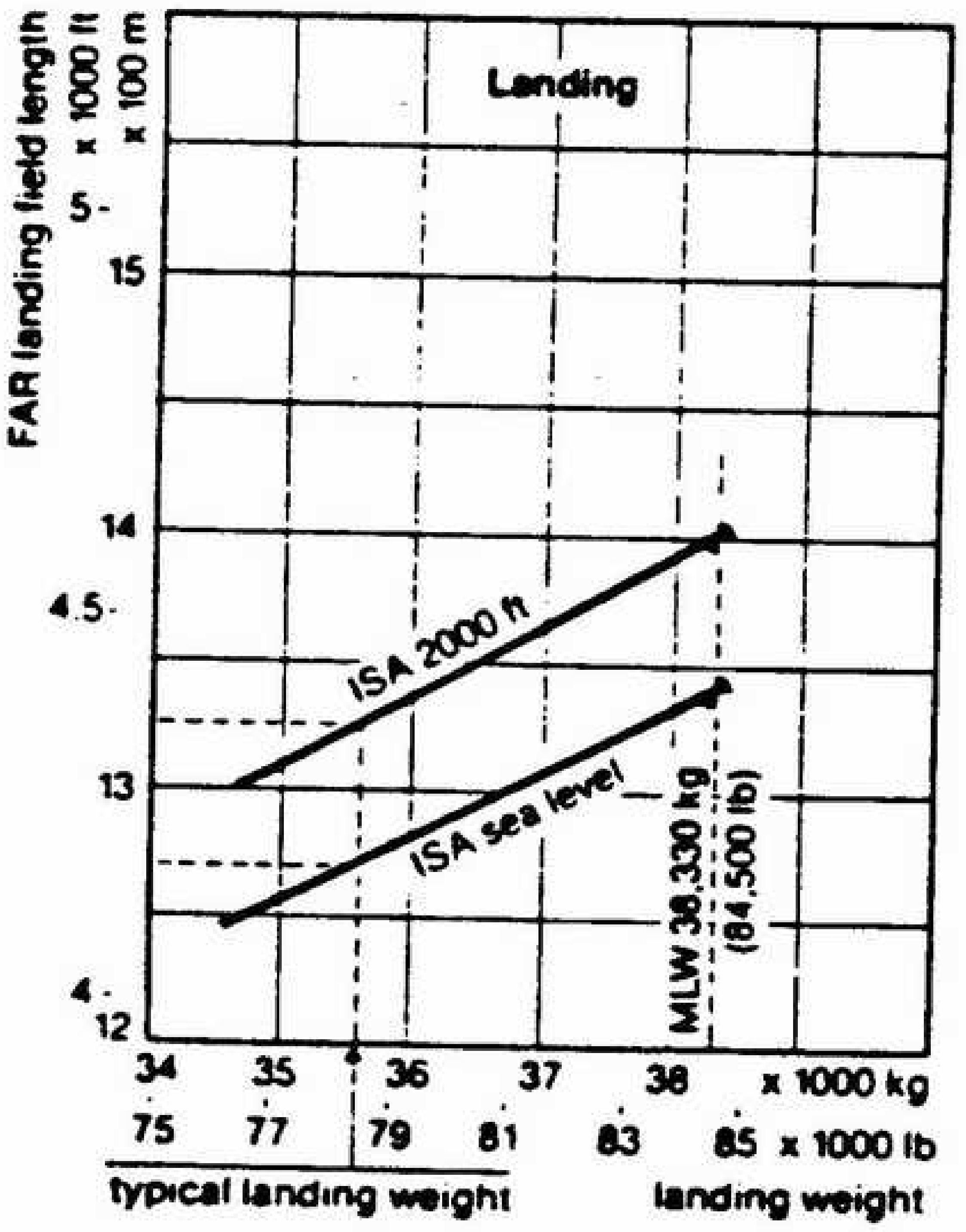


## Payload-range capability



## Field performance





### PERFORMANCE

| | |
|---|---|
| Range for 107 pax. payload at standard MTOW | 1200 nm (2240 km |
| Range for 107 pax. payload at optional MTOW | 1510 nm (2800 km |
| Max. cruise speed | Mach 0.75 |
| Max. cruise altitude | 35,000 |
| Approach speed (design) | 128 kt (MLW, 1.3Vs |
| Required take-off field length at TOW for a typical 300 nm sector (ISA, SL) | 1437 m (4715 ft |
| Required take-off field length at TOW for a typical 300 nm sector (ISA + 15°, 2000 ft) | 1727 m (5665 ft |
| Required landing field length at typical landing weight (ISA, SL) | 1277 m (4190 ft |
| Required landing field length at typical landing weight (ISA, 2000 ft) | 1335 m (4380 ft |

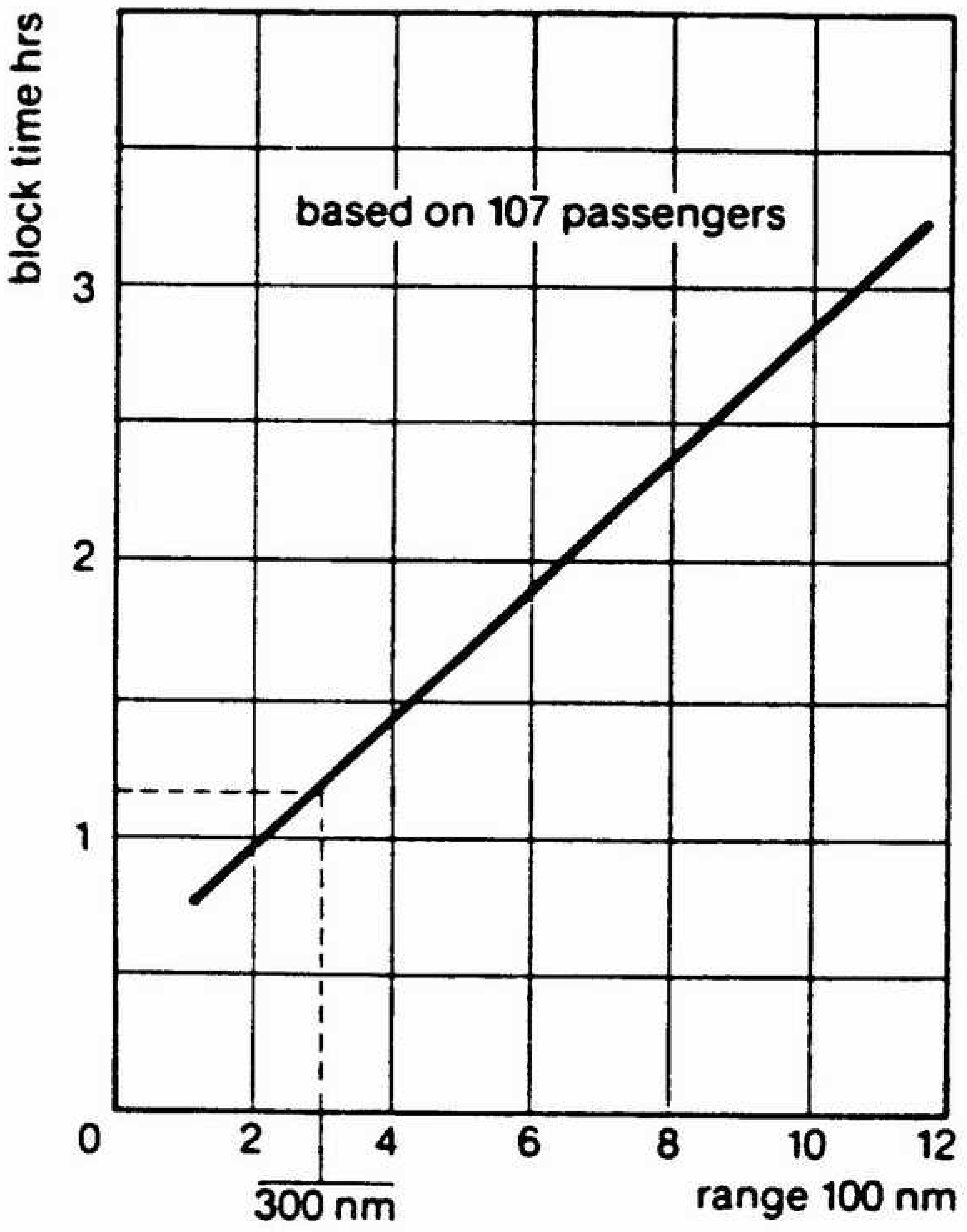
### NOISE

| | |
|---|---|
| * Take-off / Flyover | |
| MTOW 41,500 kg (91,500 lb) | |
| FAR Part 36, stage 3 limit | 89.0 EPNdB |
| Fokker 100 | 85.3 EPNdB |
| * Take-off / Lateral | |
| MTOW 41,500 kg (91,500 lb) | |
| FAR Part 36, stage 3 limit | 94.6 EPNdB |
| Fokker 100 | 94.3 EPNdB |
| * Approach | |
| MTOW 41,500 kg (91,500 lb) | |
| FAR Part 36, stage 3 limit | 98.6 EPNdB |
| Fokker 100 (flaps 42°) | 96.6 EPNdB |

**Reserves**

Fuel for overshoot to 1500 ft
Alternate : 200 nm
Holding at alternate airport : 45 minutes at 1500 ft
Approach and landing : 6 minutes.

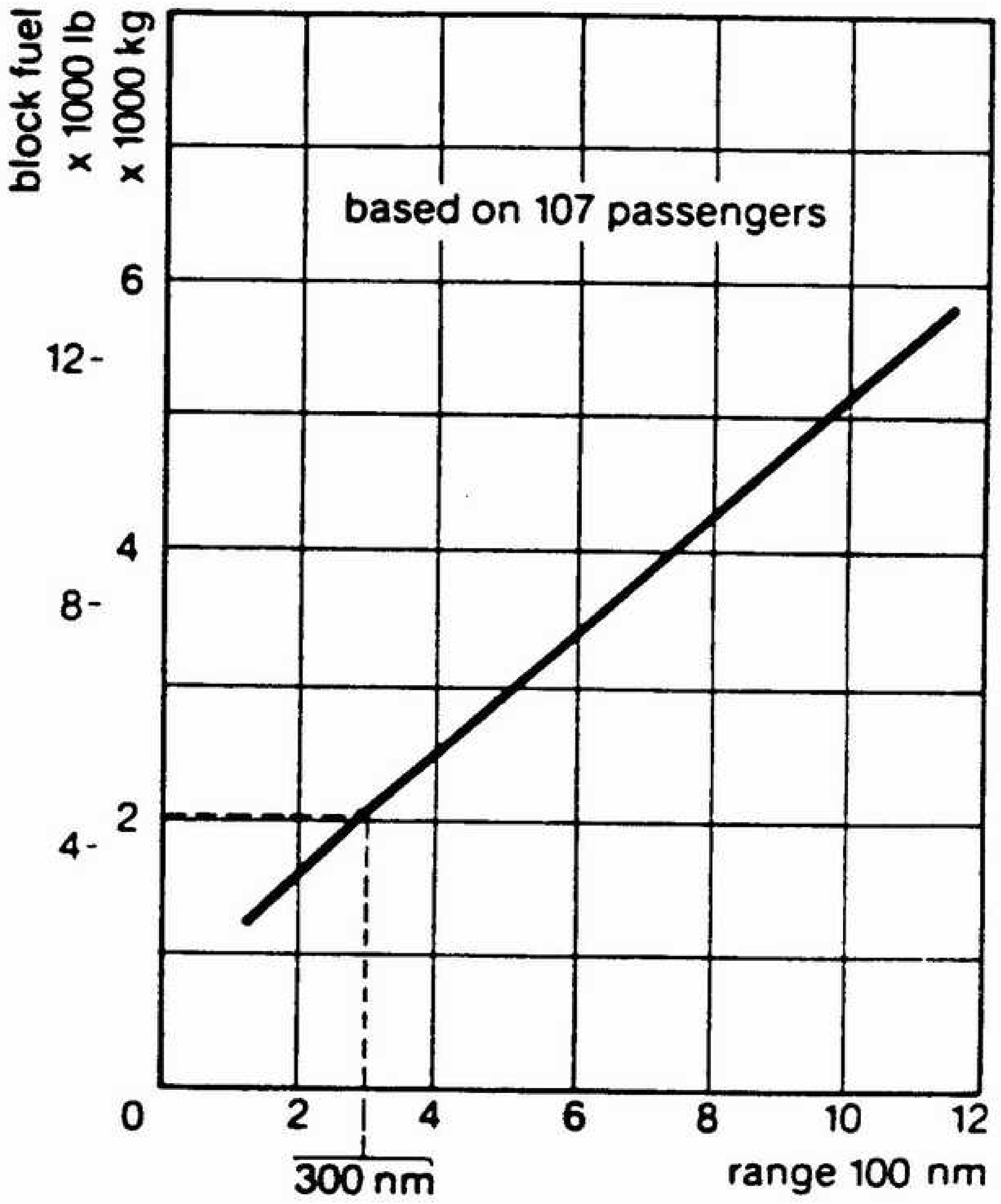
## Block time



**General**

Minimum rate of climb : 300 ft/min
Max. cabin rate of descent : 300 ft/min
Climb and descent speeds
below 10,000 ft : 250 kt CAS
Wind : zero.
Temp. en route : ISA

## Block fuel



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